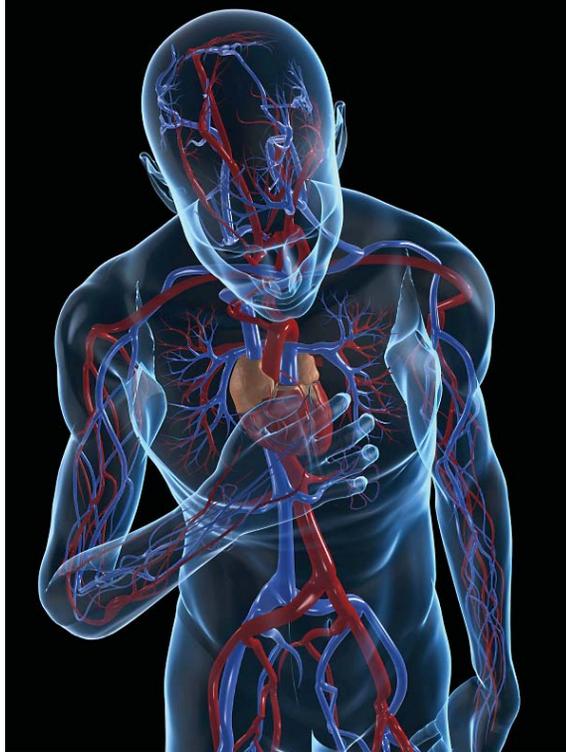

How we do it

Implementing induced hypothermia

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This is the first article in an occasional series highlighting what EMS providers are doing across the state.

Prehospital emergency medical providers play a critical role in the outcome of patients suffering from out of hospital cardiac arrest (OOHCA) — EMS can set the tone for the care of the OOHCA patient. A policy statement from the American Heart Association published in *Circulation* indicates that “Control of temperature during the initial hospital period after resuscitation from OOHCA is an important factor in recovery. Randomized trials demonstrated that in-hospital induction of mild hypothermia (33°C to 34°C) for 12 to 24 hours in comatose survivors resuscitated from ventricular fibrillation (VF) improved survival and neurological recovery. Case

series that included patients with non-VF cardiac rhythms have also demonstrated favorable outcomes.”¹

Based on recommendations from its EMS Vision Committee, the Plano Fire Department (PFD) began its investigation of implementing an induced hypothermia protocol in 2008. The Plano Fire Department EMS Vision Committee is comprised of 10 firefighter/paramedics, the EMS medical director and the EMS coordinator. The purpose of the committee is to discuss current EMS literature in order to provide the best medical care possible for our patients.

We recognized that an induced hypothermia (IH) program would require partnering with local hospitals. For IH started in the field to be effective, it must be continued in the emergency department (ED), the cardiac catheterization laboratory (CCL) and the intensive care unit (ICU). Although IH in the field is relatively inexpensive, IH continued in the hospital typically requires more expensive equipment to closely manage the patient’s core temperature. Furthermore, significant training of ED and ICU nursing staff is required to operate this equipment. Also, a number of specialty physicians, such as emergency physicians, cardiologists and critical care physicians need to collaborate on patient care and in-patient protocol development.

During its 2008 quarterly meetings with major receiving hospitals, PFD indicated its interest in IH therapy and sought the hospitals’ partnership. At that point none of the local hospitals were performing in-patient IH. However, The Medical Center of Plano (TMCP) was going through Cycle III Accreditation for

chest pain. The accreditation committee included the PFD EMS medical director, the EMS coordinator, PFD EMS battalion chief and EMS captain, and it became a venue to coordinate the prehospital and in-hospital IH program.

The IH protocol was refined throughout 2009 and shared with local hospitals at PFD receiving hospital meetings. Quarterly CE with the medical director focused on evidence for the use of IH and practical aspects of IH protocol application. TMCP began its in-hospital IH program in 2009. In September 2009 PFD performed IH megacodes and skills checkoff at the two stations treating the highest proportion of OOHCA. After a successful IH trial protocol implementation period of three months at these two stations, IH was implemented system-wide in December 2009.

PFD has relatively short transport times. Thus, we felt IV benzodiazepines would be sufficient to blunt the effect of shivering caused by ice packs and chilled fluids. Based on our review of the current literature, we chose to include any return of spontaneous circulation (ROSC) patient in our IH protocol regardless of initial rhythm. We chose not to have a minimum systolic blood pressure prior to performing IH. We feel the fluid bolus portion of IH will augment the blood pressure of a hypotensive patient and want to implement the neuroprotective aspects of IH as fast as possible. PFD chose to monitor core temperature with the Datatherm esophageal temperature probe.

In 2009, PFD performed IH on six patients. Three of the six patients survived. All three survivors were Cerebral Performance Category 1 (neurologically normal). In Plano,

patients with OOHCA who received prehospital IH achieved goal temperature *two hours faster* than patients who had OOHCA and in-hospital initiated IH.

As of January 2010, only TMCP and Medical Center of McKinney perform in-hospital IH that is continued from EMS IH. However, the entire HCA North Texas Division is beginning to implement in-hospital IH. Also, in Plano we anticipate that two other local hospitals will have IH programs in place by the summer of 2010. The Plano Fire Department is moving toward implementation of the Cardiac Arrest Receiving Facility concept as outlined in the policy statement by Nichol referenced above.

To our knowledge, Plano and McKinney are among the first fire-based EMS systems in the state to implement IH and may be the first to do so with offline protocol management. Furthermore, we feel this program is evidence of fire-based EMS systems driving excellent patient care that will lead to IH programs at all of our cardiac arrest receiving facilities.

Gamber is with Plano Fire Department and Griffin is with McKinney Fire Department.

¹ Nichol G, Aufderheide TP, Eigel B, Neumar RW, Lurie KG, Bufalino VJ, Callaway CW, Menon V, Bass RR, Abella BS, Sayre M, Dougherty CM, Racht EM, Kleinman ME, O'Connor RE, Reilly JP, Ossmann EW, Peterson E; on behalf of the American Heart Association Emergency Cardiovascular Care Committee; Council on Arteriosclerosis, Thrombosis, and Vascular Biology; Council on Cardiopulmonary, Critical Care, Perioperative and Resuscitation; Council on Cardiovascular Nursing; Council on Clinical Cardiology; Advocacy Committee; and Council on Quality of Care and Outcomes Research. Regional systems of care for out-of-hospital cardiac arrest: a policy statement from the American Heart Association. *Circulation*. 2010:121.

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